# CUTEC NEWS

The ABC's: Training at CUTEC

FACTS · INFORMATION · ANALYSES

Nr_3 www.cutec.de December 2006


## We are the world champions …

You are probably thinking of football, spectators dancing and prancing with enthusiasm in the grandstands, exciting matches, and of course the victor – Italy! Quite right: We achieved third place in this year's World Cup Championship. In this case, however, I am thinking more in economic terms: As indicated in a Handelsblatt report published at the beginning of July, we shall probably defend our title and thus remain world champions on the export sector in 2006, too. In parallel with this development, the increasing demand for private consumer goods and services is helping to revitalise the domestic economy after a long period of stagnation. This is certainly good news, highly encouraging news. Of course one must remember that a long-term prediction on such a basis is feasible only with reservations, and that one should avoid giving in to mere speculation. The effects of further changes, such as the increase in the value-added tax, on the economy still remain to be seen.

We, too, have welcome announcements in store: For the first time, third-party funds have exceeded the four-million-euro mark during the present business year. A substantial contribution to this development has resulted from the recent conclusion of a major order from the region. A far more distant, but equally encouraging event was the signing of a multi-annual consulting contract with the Government of Nigeria. A more detailed report on this topic is presented on page 5. Much closer to home, right here on our own company premises, we have now established the first interdisciplinary cluster in the field of "Fuels and Chemical Raw Materials from Biomass". This is the subject of the detailed, special report on page 3 of this issue.

Totally unexpected was the sudden death of University Professor Dr.-Ing. Michael Claußen, Department Head at Chemical Processes, in May. In his memory, we had published his necrology on our home page immediately after his death and have also included it in this issue.

Back to football: In a figurative sense, our Commercial and Accounting Department has held a leading position in Group A with 3 trainees since August, ahead of the workshops with 2 and the laboratory as well as the Department of Chemical Processes with 1 trainee each. We are very proud of these figures! (Translator's note: The "A" of Group A stands for 'Ausbildung', the German word for training.)

Yours sincerely, Otto Carlowitz

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## 4th Clausthal Expert Discussion on the topic of: "Alternatives to Oil"

***BMU State Secretary Astrid Klug delivers the official speech***

The dependence of modern industrialised societies on oil as a source of energy is a high-risk factor. Consequently, the motto of the 4th Clausthal Specialist Conference, held at CUTEC-Institut on 15th June 2006, was "Alternatives to Oil". The event was hosted by CUTEC, the Evangelische Akademie Loccum (EVLKA), and the Clausthal University of Technology.

"Our efforts to find substitutes for oil in the medium term, at least partially, must be increased, since this raw material is rapidly becoming scarcer. A reliable supply of energy and protection of the climate are two aspects of a challenge which we must face during the coming years, both in our own interest and in the interest of the generations to come", emphasised Astrid Klug, State Secretary at the German Federal Ministry

*BMU State Secretary Astrid Klug together with hosts and speakers*

*Continued on page 2*

# Résumé of the International Conference, „AOP4“

***Dr. Sievers from CUTEC elected as new chairman of the Specialist Group AOP***

*Scientific Committee and Planning Team for the Conference*

In May 2006, the 4th International Conference, “Oxidation Technologies for Water and Wastewater Treatment”, organised in cooperation with the technical universities in Clausthal and Berlin, took place in Goslar. The event was coordinated by the Department of Physical and Biological Processes at CUTEC. With 180 participants from 38 countries, the resonance was highly encouraging. The topic of the conference was the oxidation of wastewater components by advanced oxidation processes (AOP) in water, waste water, and sludge. Among other methods, AOP includes ozonisation, oxidation by means of UV radiation/hydrogen peroxide, and photocatalysis. Fundamentals and applications in this discipline were discussed in 30 oral presentations, some at a very high level, and illustrated in 140 posters. At the present conference, attention was focused on the oxidation of anthropogenic micropollutants, such as antibiotics. The presence of eight exhibitors promoted the exchange of experience between researchers at institutes or universities and engineers from the industry.

A total of 17 participants from developing countries also attended the conference; their participation was rendered possible by funds from the Deutsche Bundesstiftung Umwelt (DBU) (German Federal Environmental Foundation). In this context, we wish to express our sincere thanks to the DBU for this important contribution to the exchange of specialised information, particularly on German environmental technology. The visiting tour of the waste-water treatment plant at the Hella Company in Lippstadt as well as the Hellsiek plant for the treatment of landfill leachate near Detmold proved to be of special interest, since the technical implementation of AOP is clearly visible at such facilities. The excursion ended at ACHEMA with visits to the stands of WEDECO AG, Werle Umwelttechnik GmbH, and Linde AG, as well as the opportunity to acquire comprehensive information in the exhibition halls.

Personnel changes have taken place in the Specialist Group AOP, under whose patronage the conference is held. Prof. Vogelpohl has retired from his chairmanship for reasons of age. Dr. Michael Sievers of CUTEC has been elected Chairman, and the previously vacant post of secretary is now held by Dr. Achim Ried of WEDECO.

The conference was a complete success: During an enquiry at the end of the event, the participants indicated a high level of satisfaction with the various aspects, especially organisation, technical support, and scheduling, as well as the fields of fundamentals and innovations. (schä)

**Continuation from page 1**

# 4th Clausthal Expert Discussion on the topic of: “Alternatives to Oil”

***BMU State Secretary Astrid Klug delivers the official speech***

of the Environment, Nature Conservation, and Reactor Safety (BMU), who held the official speech for Minister Sigmar Gabriel.

The political importance of new energy sources should not be underestimated, especially in view of the developments on the world market for oil. Besides the major consumers in the western industrial countries, the demand for oil is increasing in the developing economies of the Middle and Far East. China has already displaced Japan from second place in the list of consumers. Oil as a natural resource is steadily vanishing because of increasing mobility and rising standard of living.

“In order to prevent energy from becoming a luxury item”, sustainable and economically expedient solutions must be developed. New technology, including the second generation of biofuels, offers the chance we need for maintaining our own mobility while allowing the new industrial nations to achieve the same mobility. With the integration of existing infrastructures, such as filling stations or natural gas supply pipelines, economically viable concepts must be derived for ensuring a sustainable supply of energy.

In contrast to the biofuels previously available, the biofuels of the second generation are characterised by a decidedly improved $CO_2$ balance and provide a higher yield from a smaller land area. In addition, many more raw materials are suited for the production of these fuels.

Dr. Schütte from the Fachagentur für Nachwachsende Rohstoffe e.V. then indicated various concepts for biofuels, and Dr. Heinrich from VW explained the viewpoint of the automotive industry. Prof. Carlowitz reported on corresponding major research activities at CUTEC, and Prof. Beck, Vice President of Clausthal University of Technology, described energy research in Lower Saxony. The event, which was moderated by Dr. Dally, EVLKA, and Dr. Lahl, BMU, allowed a rewarding exchange of views on the different aspects of the development and promotion of innovative biofuels.

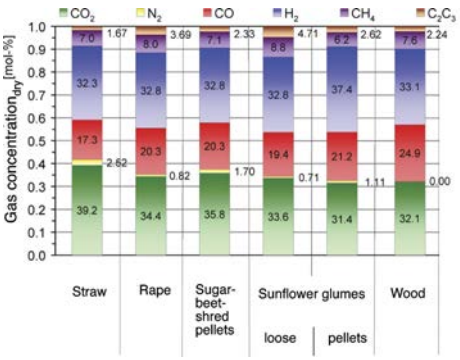
As of 2007, new general conditions will apply to the promotion of biofuels in Germany. Among other factors, a tax advantage is planned for biofuels of the second generation until 2015. However, this political instrument must be accompanied by research projects on the scientific and economic sectors. Mrs Klug certified that the researchers in Clausthal are on the right track in this respect. “We look forward to successful cooperation”. (kra)

# Results and projects of the cluster, Fuels and Chemical Raw Materials from Development of technology for the production of fuels from biomass

***Development of technology for the production of fuels from biomass***

Continuing support for the use of biomass as an alternative to conventional sources of energy, such as oil, natural gas, or coal, presents a serious challenge to society for the near future. Besides the highly desirable and justifiable objective of becoming less dependent on politically unstable regions, protection of the climate is of paramount importance. Natural disasters during recent years (such as the hurricanes in the United States, or the tsunami tidal wave in the Far East) have made it quite clear that Nature is sounding an unambiguous alarm. Biomass is nearly neutral with respect to $CO_2$ and offers a chance to avoid further heating of the Earth beyond the critical and irreversible 2 °C mark, provided that people are also willing to alter their living habits in favour of a more responsible energy policy.

For the purpose of application, the




*Synthesis gas composition for various types of biomass*

term biomass encompasses a wide variety of different plants, plant components, as well as residues. However, the various materials differ significantly with respect to crops, harvesting, processing, and thermochemical behaviour (see the figure above: Composition of synthesis gas as a function of the biomass type employed). From a technical standpoint, processing of the materials is considerably more complex than is the case with conventional sources of energy. All known methods of converting biomass to more conveniently transportable forms operate with the basic building blocks of pretreatment, thermal decomposition, gas purification, and gas treatment, as well as synthesis. At CUTEC, process-engineering projects are in progress for the production of fuel, especially Diesel fuel, from biomass ("Biomass to Liquid = BtL"). The projects

*Hydrocracking plant*

require close cooperation between the Departments of Thermal and Chemical Processes. In order to create the necessary organisational framework for this endeavour, the cluster, "Fuels and Chemical Raw Materials from Biomass", was established at the end of 2005. During the past months, the main task was coming to grips with the major EU project, RENEW, which demanded the creation of appropriate boundary conditions, especially for the functions of the central plant modules – the Fischer-Tropsch reactor and the hydrocracker – (see figure on the left: Hydrocracker). Future tasks for the cluster include in particular:

- Production of an FTS raw product suitable for pretreatment
- Hydroprocessing by the BtL process for enhancing the yield
- Realisation of the ABSART Project (design and construction of a synthesis gas purification unit specifically for biomass gasification)
- Application for, and execution of projects involving applications-oriented use of the equipment at the Departments of Thermal and Chemical Processes, which are unique in Germany by virtue of their concept

If the pilot plant is actually expanded further and adapted to deal with problems posed by society, such as the synthesis of methane or of basic chemicals such as methanol, CUTEC and the German Federal State of Lower Saxony will indeed have a chance to introduce future-oriented technology to the market. (vd)

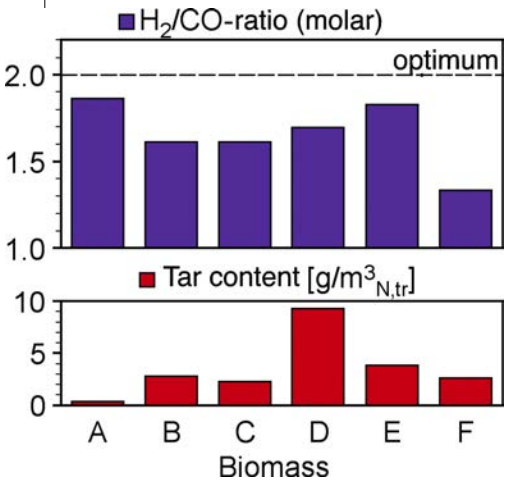
# New Results from Project RENEW

***Investigations on the quality of the synthesis gas produced from biomass***

In contrast to the well known Coal to Liquid (CtL) and Gas to Liquid (GtL) processes, the Biomass to Liquid (BtL) process is distinguished especially by the type of primary energy source employed. Instead of using coal or natural gas, biogenous input materials (as a rule, plant biomass) are converted to fuel. Besides high quality, synthetic BtL fuels are characterised particularly by their $CO_2$ neutrality and sustainable reproducibility.

In comparison with fossil energy sources, however, the material properties of biomass are more complex. Consequently, research is necessary, especially in the field of thermochemical synthesis gas generation. The need for flexibility in gas generation for accommodating a wide range of biomass types is one of the major challenges. Furthermore, the discrepancy between the quality of raw synthesis gas and the stringent requirements on purity for the synthesis process demands innovative solutions in the development of BtL processes.

Within the scope of the RENEW project, CUTEC is considering the extent to which the composition or quality of the synthesis gas depends on the type and properties of the input material, among other activities in this field. Experiments recently conducted in the fluidised-bed pilot plant at the Institute have yielded new results on this subject. Under essen-




*$H_2$/CO ratio and tar concentration in the synthesis gas from the gasification of different biomass types*

*Continued on page 4*

# New research association, Energie Niedersachsen (FEN) established

***Subdivision into ten component projects – CUTEC expands Energy Park***

With the opening session of the FEN at Clausthal University of Technology in May 2006, the largest research association of Lower Saxony began its work. In July 2006, scientific work began with the ten individual projects in the fields of electrical engineering, mechanical engineering, and computer science. In the coming three years, answers to the following central questions must be sought: How can electric power from renewable sources be supplied to the consumer in a reliable and constant manner? How can the efficiency of small combined heat and power units be improved, and how can small power producers cooperate with the large energy suppliers in a technically and economically effective way? The FEN participants are the Technical University of Braunschweig, Clausthal University of Technology, the University of Hannover, the University of Applied Sciences in Hannover, CUTEC, OFFIS (Oldenburger Forschungs- und Entwicklungsinstitut für Informatik-Werkzeuge und -Systeme [Research and Development Institute for Information Tools and Systems]), and the University of Oldenburg. In order to avoid duplication of work, ten component projects have been established.

TP1: Operation of KWK units in low-voltage grids
TP2: Energy storage concepts for renewable energy sources (TU Braunschweig)
TP3: Energy conditioners, fuel cell units with electronic synchroniser for stable integration into the power grid (IEE, TU Clausthal),
TP4: Effect of decentralised power generation on energy quality, grid operation, and grid topology
TP5: Monitoring and diagnosis of equipment with power electronics (University of Hannover)
TP6: Power control systems
TP7: Optimising heat output coupling
TP8: Sustained operating stability of internal combustion engines in KWK units for decentralised power supply (FH Hannover)
TP9: Testing of equipment: stable operation of micro-grids, for the example of the Energy Park Clausthal (CUTEC and IEE, TU Clausthal)
TP10: Simulation model for combined control of units in the low-voltage grid (OFFIS)

Within the scope of the FEN Project, CUTEC also intends to expand the Energy Park and virtually integrate the biogas plant in Jerstedt, which is funded by the DBU, into the Energy Park. In the coming months, a Stirling-BHKW is to be operated with biogas on site. Moreover, integration of an absorption refrigeration unit into the Energy Park for utilisation of waste heat is planned. (sen)

# EU BIOWELL Project officially started

***BIOWELL stands for a biological source of energy***

A few days ago a contract between CUTEC and the European Commission was signed in Brussels for funding the BIOWELL Project. Thus, the official starting signal has been given for the project with a total funding volume of 1 300 000 EURO. Participants in the project include three research institutions as well as five small and medium-sized enterprises (SME) from six European countries. The project, with a duration of two years, is being coordinated by CUTEC.

The name "BIOWELL" stands for a "biological source of energy" (biogas) and draws attention to the major purpose of the project, that is, enhancing the efficiency of biological processes in biogas plants for employing renewable raw materials as a source of energy.

The initial objective of the project is the systematic investigation of various methods for the pretreatment of biomass and reactor contents for activating the biological processes of anaerobic digestion and energetic balancing on a laboratory and pilot-plant scale. During a second project phase, selected processes are to be optimised and evaluated in a demonstration pilot plant.

The participating research partners (two universities and CUTEC) have assumed the tasks of developing and evaluating the new process. Their contributions to the project thus include their latest results and special know-how in the field of biomass pretreatment technology:

- Technical University of Prague: ultrasonics
- City University of Dublin: cutters, macerators, process optimising
- CUTEC: homogenisers, biogas measurement, process evaluation

The SME are providing the necessary machines and plant components and are responsible for the technical implementation of the overall system (demonstration plant). After completion of the project, the introduction on the market and the economic utilisation of the process thus developed are likewise the responsibilities of the companies.

For CUTEC as German representative in EU projects in the program, "COST-Environment", the BIOWELL Project has a special meaning.

This project also benefits from the results and many years of experience in the field of enhanced efficiency in biological processes at CUTEC. This know-how has accrued from previous research projects, some of them European, (WAMBIO, BIOFERM, Gas-measuring cell, INature, AGROIWATECH, Greengas). The utilisation of synergistic effects offers a chance for CUTEC to further expand the major field of "renewable energy sources" and to strengthen its position as a result of excellent European research in the environmental field. (schl)

**Continuation from page 3**

# New Results from Project RENEW

tially constant test conditions, the effect of six different types of biomass tested (A to F) on the attainable synthesis gas quality has been investigated. The properties of the synthesis gas indicate significant differences in the hydrogen content and the concentration of undesirable hydrocarbons (tar), among other items (see figure, p. 3). The $H_2/CO$ ratio in the synthesis gas, which is decisive for the BtL process, is about 1.86 for biomass A and thus approaches the optimum of ~2 (Fischer-Tropsch synthesis) very closely. In comparison, a ratio of only 1.3 is attainable with biomass F under the same conditions. This result is most probably due to catalytically active ash components, which are entrained into the process in quantities which depend on the type of biomass.

A significant dependence of the tar content on the particle size of the input material has been observed. For the same type of biomass, the gasification of the finer material D results in a considerably higher hydrocarbon content in the synthesis gas than gasification of the pelletised material E. Further investigations must be performed to determine whether this observation is due to differences in the residence time of solids in the gasifier. (schi)

# CUTEC signs a contract with the Federal Capital Territory, Abuja Nigeria as the General Environmental Consultant/Adviser

Since several years, CUTEC has been co-operating successfully with the Nigerian Government in Abuja on environmental matters of the great nation. Some high-ranking Nigerian government officials visited CUTEC in Germany for detailed discussions and site visits to ensure effective and sustainable environmental technology transfer and manpower development. Nigerian engineers participated in practical training programmes organised by CUTEC in Germany. The dynamic and result-oriented co-operation between both parties has resulted to a five-year extensive environmental consulting contract which was signed in June 2006. The CUTEC's Manager for International Operations, Dr.-Ing. T. I. Onyeche signed on behalf of the Managing Director, Prof. Otto Carlowitz while the Executive Secretary of the FCT, Engr. M. S. Alhassan, signed for the FCT, Abuja, Nigeria.

This contract entails the tasks to be accomplished by CUTEC during the stated period. These tasks include a comprehensive environmental audit of the city and the Federal Capital Territory as well as a review of all existing environmental laws. In this context amendments of the legislation or introduction of new environmental laws may be recommended.

Moreover, the existing solid, liquid and gaseous waste facilities should be examined with recommendations for improvement to international standard. The development of an integrated solid waste management facility for Abuja, including a modern landfill, is vital. The CUTEC team would design a first-class solid waste management facility for the FCT, Abuja.

*From left: Engr. Okafor, Engr. M. S. Alhassan, Dr.-Ing. T. Onyeche*

The facility implementation shall be phased into setting-up of strategic targets ranging from solid waste collection, transportation, treatment and final disposal. The tasks also include recommendations on the protection of flora and fauna.

To ensure appreciation and effective operation of this concept amongst Nigerians, an environmental awareness campaign has to be planned for the territory. The CUTEC team and the FCT representatives would plan the most effective and sustainable approach for best awareness campaign in Abuja considering the local conditions and cultures.

These unique environmental services from CUTEC would ensure that there exists continuity of the entire concept. Hence, regular practical training programmes are planned in the field of environmental engineering and management. The local expert knowledge is considered important in this project for efficient utilization of the already existing resources. This project has the potential to raise the environmental status of the FCT to the best international standard and act as a showcase for the international community to appreciate the impact of the FCT, Abuja in the global campaign on sustainable environmental safety. (wb)

# in memoriam: Prof. Dr.-Ing. Michael Claußen

On 11th May, we were saddened by the unexpected death of our department head,

University Professor Dr.-Ing.
Michael Claußen.

Since 1st May 2003, Professor Claußen has served our Institute as Appointed Professor from Clausthal University of Technology and Head of the Department of Chemical Processes. His special field of activity was characterised by the denomination of his professorship, "Environmental Process Engineering for Mobile Systems". From the very beginning of his activity at CUTEC, he has contributed decisively to the growth of the Institute, especially in the field of chemical processes.

With his advice and specialised knowledge, he was constantly engaged in the work of the Institute and was a respected representative of our company on the national and international levels. Among his coworkers and colleagues, he was esteemed and recognised.

We shall miss Professor Michael Claußen and remember him with gratitude and honour. We extend our sympathy to his family.

The Management, Workers' Council, and employees at CUTEC-Institut GmbH


## IMPRINT

**Publisher:** CUTEC-Institut GmbH
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**Layout and setting:** G. Wessels (wes)
**Photos:** Gert-E. Knochen (kn)
**Production and supply:**
CUTEC-Institut GmbH
Leibnizstr. 21+23
38678 Clausthal-Zellerfeld
Tel. 05323 933-0 · Fax 05323 933-100
E-Mail: cutec@cutec.de
Internet: www.cutec.de
**Publication:**
Several issues per year in irregular order. The issues can be ordered at the a.m. supply address.

# CUTEC visits national and international trade fairs and events

CUTEC-booths always well visited – in Hannover at the IdeenPark not only by scientists

## ACHEMA 2006 in Frankfurt

From 15th to 19th May 2006 the fair ACHEMA attracted experts from the fields of chemical engineering, environmental engineering and biotechnology. Altogether 3,880 exhibitors from 50 countries participated in the fair. CUTEC's booth presented innovations from the fields of wastewater treatment, process control and production of fuels from biomass. The exhibit at the booth was an innovative Flake Forming Reactor (FlocFormer), a conditioning system for sewage sludge. The lecture of Dipl.-Ing. Schindler and Dipl.-Chem. Maly with the topic "The Biomass-to-Liquid-process at CUTEC" received great interest. Key aspects of this lecture were the anaerobic digestion of biomass and the Fischer-Tropsch synthesis. Numerous conversations as well as lots of inquiries proved that CUTEC's presence at the fair was very successful. (schr/ni)

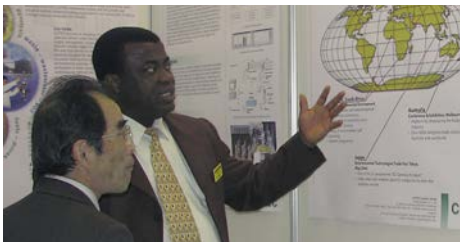
*Dr. Schröder (l.) explains the operation of the FlocFormer to an interested visitor*

## Tag der Niedersachsen in Melle

From 14th to 16th July 2006 the 26th "Tag der Niedersachsen", a state festival that illustrates the cultural diversity of the German Federal State of Lower Saxony, was organised by the city of Melle. Upon invitation of the DBU, one of Europe's largest foundations, which promotes innovative and exemplary environmental projects, 52 selected innovative companies from all areas of Lower Saxony took part in the event. By means of an innovation park, they impressively demonstrated the potential and economic power of Lower Saxony. CUTEC was represented by Dr. Schröder and Mr Niedermeiser focussing on key areas in the field of wastewater treatment and generation of fuels from renewable resources. Various inquiries and discussions as well as the positive response of the visitors made the innovation park a great experience for all participants. (schr/ni)

## N-Expo 2006 in Tokyo

Within the scope of the programme "EU Gateway to Japan", initiated by the European Commission, CUTEC participated in the New Environmental Exposition, abbr. N-Expo in Tokyo from 22 to 26 May 2006. The institute was represented by its Manager for International Operations Dr.-Ing. T. Onyeche and his assistant, Ms. W. Weber, B.A..



*Dr. Onyeche (r.) in Tokyo representing CUTEC*

CUTEC was among the few selected companies for this programme which aims at helping European entrepreneurs enter the Japanese market. This unique European programme supports the participants both in funding and organisation. The selected companies were located in a special EU Pavilion at the Tokyo Big Sight in order to effectively attract the interest of domestic and foreign visitors. In addition to the eight companies from Germany, there were exhibitors from Austria, Belgium, Denmark, Finland, France, Great Britain, Italy, Hungary and the Netherlands at the trade fair.

CUTEC's interest was to have an insight into the Japanese market especially as regards the Japanese business culture as well as to establish some new contacts in the field of environmental research and development. The CUTEC team exhibited a special unit for the laboratory biogas measurement from anaerobic digestion of biomass, sludge, wastewater, etc.. This unit attracted the attention of Japanese and other Asian professionals and research fellows.

The CUTEC booth attracted a lot of visitors as a result of its unique environmental services and sustainable technologies. Prior to the fair, the European Commission carried out an extensive global campaign on the event.

A reception organised by the European Commission in Tokyo during the show created a forum for European participants to discuss the economic, political and research potentials of the entire event as well as the potential stakeholders.

Dr. Onyeche was very pleased with the results of the trade fair because the event intimated the CUTEC team with the business environment in Japan especially in the environment sector. The event also provided the CUTEC team with valuable Asian business contacts one of which recently resulted to a project contract with a Japanese firm on the application of one of CUTEC's sludge treatment technologies. This rare event acted as a platform to showcase CUTEC's environmental services to the Asian market. (wb)

## IdeenPark 2006 in Hannover

From 20th to 28th May 2006 ThyssenKrupp presented with more than 50 partners from science, society, economy and media the IdeenPark on the fairgrounds of Hanover. The exhibition, which had as its motto „Discovering future technology", gave in a playful way an insight into the world of innovation, research and development. With more than 200,000 visitors – al lot of them school classes – also at the booth of CUTEC there was a large crowd. The project "No more fuel or gas available? Then just plant it" focused on generating energy from biomass. According to the motto "There are no stupid questions" the young but also the older visitors asked all questions that were preying on their mind, e.g. *What are energy crops? How do you gain gas and oil from these energy crops? Will my car run with this green stuff in 20 years?* All of these questions were answered. The CUTEC employees explained age-based the process chain for production of bio

*Do touch! Curious young researchers at the CUTEC booth*

fuels with the help of a pilot plant model. Samples of biomass and biofuel as well as a bed with the energy crop maize served as

*Continued on page 7*

## Report from the Workers' Council: Workers' Council election 2006

The regular Workers' Council election on 27th April 2006 has resulted in the following constellation in the five-member Workers' Council: Carmen Kiefer (Vice-Chairman), Markus Lenk, Kay-Morten Schenk, Hans-Adolf Teegen, and Dr. Torsten Zeller (Chairman). The substitute member is Gerd Cronjäger. The period of office is four years. The workers' Council wishes to express its sincere thanks to all colleagues for the good participation in the election as well as the confidence thus placed in the new members, and to the electoral committee headed by Dipl.-Ing. Sven Schäfer for the excellent organisation. We are convinced that we can contribute to the successful development of CUTEC on the basis of a constructive and trustful cooperation with the Management in the future, too. (ze)

## Documentation of the network, "Energy from Phytoremediation" has been published

As an innovative approach, the topical questions of obtaining energy from renewable sources and decontamination of soils have been linked in the interdisciplinary network, "Energy from Phytoremediation". With its unique character, this combination has been established for the first time in this network, thanks to a BMBF funding initiative. The aim of the network was and still is to determine the extent to which land areas can be decontaminated by plants with subsequent utilisation of the resulting biomass as a source of energy, which contaminated sites, plants, and energetic processes are eligible for this purpose and suited for combination, and which limiting factors must be taken into account.

Some forty scientists have evaluated the state of the art in the fields of biomass utilisation as a source of energy and phytoremediation. The experts in the fields of genetic engineering, process engineering, forestry, economics, biology, soil science, remediation of polluted sites, ecology, chemistry, and agriculture have united their professional competence and experience in a unique manner within the scope of the network. In May, the results were published in Volume 66 of the CUTEC Publication Series and clearly indicate that the network approach must be considered on an interdisciplinary basis in order to develop sustainable solution concepts. (kra, les, ze)

Continuation from page 6

## IdeenPark 2006 in Hannover


*Happy winners of the competition*

illustrative material. But highlight of the presentation was without doubt the CUTEC-Quiz. Thus the young researchers could combine the theoretical content they had just learned with practical experience. If they were lucky they could win "cool prices" such as experimental kits and books. There were no losers since all participants were rewarded with a large portion of popcorn – a sweet energy donor from maize – for their work.

Because of the big success of the Ideen Park, Mr Christian Wulff, Prime Minister of Lower Saxony wants to get going a similar project for the whole of Lower Saxony. Perhaps already in 2009 we can support the first Lower Saxon "IdeenExpo" with our projects. (wes)

## Training at CUTEC

***In today' issue: Vocational retraining of Martina Ketterer as a laboratory assistant in physics***

In prior issues of CUTEC-News, training in the Commercial and Accounting Department, the Electrical Workshop, and the Mechanical Workshop was described. However, these are not the only fields where young people are being trained at CUTEC; since 1st April 2006, training is also taking place in the physical and chemical fields. Mrs Ketterer has applied independently for vocational retraining as a laboratory assistant in physics at CUTEC, and the Bundesagentur für Arbeit (German Federal Labour Office) is providing the necessary funds for 28 months. A prerequisite for training of this kind is the successful completion of one's realschule (secondary school) education in scientific subjects or of one's abitur (A-levels). Typically, the duration of training is 3.5 years, since the training program is highly diversified. Specialisation usually does not occur until a later stage of professional life. In the course of training, a laboratory assistant in physics must also learn to work in the biological and chemical laboratories, as well as in the mechanical and electrical workshops. As the name implies, however, a major task comprises the preparation, performance, and evaluation of tests and experiments in all fields of physics. Of course, CUTEC cannot cover all types of experiments and therefore cooperates closely with the Institute of Physics and Physical Technology at Clausthal University of Technology. Laboratory assistants are likewise being trained there and are taking part in the same basic physical practicals as Mrs Ketterer; conversely, the trainees at the Physics Institute can take part in the biological practical at CUTEC. Furthermore, practicals are conducted with the equipment present at CUTEC, such as the instruments for particle-size measuring technology, density and surface determination (see above photograph). Mrs Ketterer will learn to use the facilities available in the Department of Chemical Processes as well as those in the Department of Physical and Biological Processes. An excellent chance of combining experimental set-up with chemical and physical sampling and measurement is afforded by the measuring unit as specified in § 26 BImSchG at CUTEC. If one compares the normal training period of 42 months with the 28 months allotted to the present retraining program, it is obvious that Mrs Ketterer is facing a special challenge. (wo)

*Martina Ketterer (r., trainee at CUTEC) and Christiane Lehmann (l., trainee at the Physics Institute) receiving instruction from Dipl.-Ing. A. Wollmann in the use of the surface measuring instrument*

# New in the CUTEC team

*Dipl.-Ing., Dipl.-Geoökol. S. Martin*

As of 1st July 2006, Dipl.-Ing., Dipl.-Geoökol. Stefan Martin has been working in the Department of Thermal Processes. Mr Martin completed his studies in geo-ecology with the Diplom at the University of Bayreuth, as well as postgraduate studies in environmental process engineering at the TU Bergakademie Freiberg. During the current year, he wrote his Diplom thesis on the topic of "Separation of Elemental Mercury from the Gas Phase on Modified Activated Lignite Coke". His major task at CUTEC in the coming years is the coordination of the joint national project, BioLog. This responsibility includes the scientific supervision of tests in the ArtFuel plant as well as on the reverse-acting grate, the project coordination, and cooperation in the accompanying ecological and economic research.

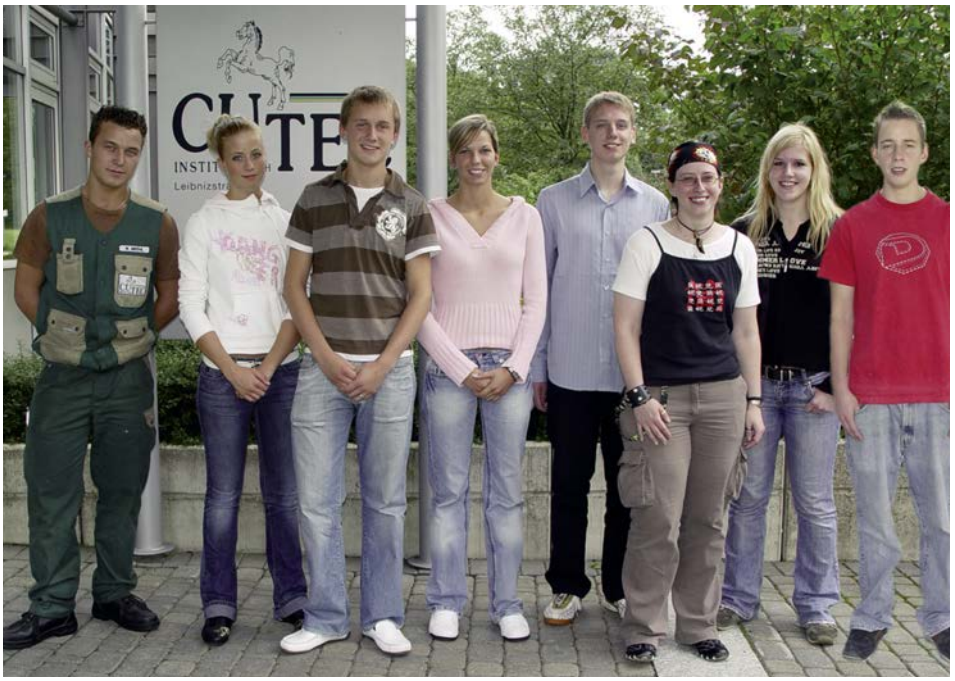
*Dipl.-Ing. N. Senkel*

On 1st September 2006, Dipl.-Ing. Nadine Senkel began her activities at CUTEC-Institut. During her studies in environmental engineering at Clausthal University of Technology, Mrs Senkel was already employed as scientific assistant at our Institute and is thus well known to many CUTEC colleagues. Since completion of her Diplom, she has been competently performing scientific work for CUTEC in the Energy Park and in the research association, Energie Niedersachsen (FEN) (see the report on page 4 of this News issue).

*Ms C. Zeloni*

In April of this year, we reported that the Department of Thermal Processes is participating in the Marie Curie-Program, which is funded by the EU. We extend our welcome to the first participant, Chiara Zeloni from Italy, who will be a guest at our Institute for the coming 18 months. Her scientific activity is concentrated in the fields of gasification and pyrolysis. (he/wes)

# The "CUTEC-Eight" in training: 7 trainees and one practical trainee



*From left: Martin Bröhl, Stefanie Auberg, Frederik Brauer, Britta Kahla, Oliver Börker, Martina Ketterer, Isabella Legzdins und Michael Dreilich*

It must have appealed to them here at our Institute: On 1st August, our two former practical trainees, Stefanie Auberg and Oliver Börker, began their training in the Commercial and Accounting Department, where Frederik Brauer has also begun his year of practical training. Somewhat later, on 1st September, Isabella Legzdins started her training as a laboratory assistant in chemistry in the laboratories at the Department of Chemical Analysis. Furthermore, Martina Ketterer has been retraining as a laboratory assistant in physics at CUTEC since April (see the report on p. 7). Our third-year trainees are almost "old hands" in the business: Mrs Kahla in the Commercial and Accounting Department, Mr Dreilich in the Electrical Workshop, and Mr Bröhl in the Mechanical Workshop. All have gathered for the photographer in the CUTEC entrance area. (he)